

BRACHYURA FROM THE CRETACEOUS OF CENTRAL QUEENSLAND.

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The material described is from the Tambo Formation of Cretaceous (Upper Albian) age. Most of it was collected near Dartmouth, Central Queensland, in surface nodules of buff argillaceous limestone.

An extended description of *Homolopsis etheridgei* (H. Woodward) (= *Prosopon etheridgei*) is given. The type of this species is in the Queensland Museum, and fourteen examples have been collected near Dartmouth. Two new genera and species are described. The preservation of the material studied is good; the shell is retained in part, and it has been possible to give details of some of the appendages.

Apart from the crabs, the collection from near Dartmouth in the Queensland Museum includes the pelecypod *Aucellina hughendense* (Etheridge), the cephalopods *Nautilus hendersoni* Etheridge Jr., *Aletoceras plectoides* (Etheridge Jr.), *Myloceras orbiculus* Whitehouse, *Myloceras* sp., *Labeceras papulatum* Whitehouse, undetermined macrurous decapods and teeth of a shark, *Lamna* sp.

The fossil crabs are all referred to the sub-tribe Dromiacea, the earliest representatives of which are known from the Jurassic of Europe. In the Cretaceous there was an increase in the number of species referable to the Dromiacea and an extension of the geographical range of the group. Other brachyurous groups appeared in this period.

I am indebted to Miss Sanna Shannon who presented collections of these fossils from near Dartmouth to the Queensland Museum (Q.M.) in 1946 and 1949, to Professor W. H. Bryan for the opportunity to study material in the collections of the Department of Geology, University of Queensland (U.Q.) and to Mr. C. C. Morton, Chief Government Geologist, for the loan of material from the collections of the Geological Survey of Queensland (G.S.Q.). I wish to thank Dr. M. F. Glaessner, of the University of Adelaide, for his interest in this work and for the gift of some literature not readily obtainable in Australia.

Sub-tribe **DROMIACEA** De Haan.Family **THELXIOPIDAE** Rathbun.**HOMOLOPSIS ETHERIDGEI** (H. Woodward).

Plate 2, figures 1-3; figure 1.

Prosopon etheridgei, H. Woodward, 1892, Proc. Linn. Soc. N.S.W., Ser. 2, 7, p. 301, pl. 4; Etheridge Jr., 1917, Publ. Geol. Surv. Qd, 260, p. 5, pl. 1, figs 1-4.

Homolopsis etheridgei (H. Woodward), van Straelen, 1928, Bull. Acad. Belg. Cl. Sci., Ser. 5, 14, p. 619.

MATERIAL.—Type, F.2875, Central Queensland (Q.M.). Incomplete cephalothorax and abdomen preserved as extensively eroded shell material and weathered internal mould in buff argillaceous limestone.

F. 2796, F. 2843, F. 2845, F. 2846, F. 2847, F. 2848, 10 miles N. of Dartmouth, Central Queensland (Q.M.); F. 14923, 10 miles N. of Dartmouth, Central Queensland (U.Q.); F. 910, Beaconsfield, Central Queensland (G.S.Q.).

AGE.—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—33–51 mm.

Carapace, inflated, ovoid-triangular, longer than broad (ratio 1.14:1); greatest width at one-third of length from posterior; laterally slightly convergent, anteriorly produced, postero-laterally rounded, posteriorly truncated. Regions and lobes well-defined, conspicuously sculptured with granulated prominences; furrows strong. Side-walls strongly reflexed, rounded, with no lateral edge. Linea homolica extending from extremities of posterior truncation to orbits.

Frontal region with prominent rostrum directed antero-ventrally, slightly elevated at tip, slightly excavated posteriorly, with two short anteriorly directed spines at base. Orbits incomplete, flanked by sharp antennal spine. Gastric region sub-circular, bounded posteriorly by cervical furrow; this furrow bent posteriorly behind hepatic region and uniting with branchio-cardiac furrows. Mesogastric lobe with narrow produced anterior portion, delimited by two furrows passing anteriorly into base of rostrum; ornamented with an elongate anterior, rounded central, and pair of laterally directed prominences. Other paired lobes of gastric region ornamented with line of three prominences on inner margin and irregular elevations laterally. Hepatic region dorso-laterally with three spinous prominences, one forming antero-lateral angle; ventro-lateral development strong, smooth. Urogastric region separated by deep furrow from cardiac and branchial regions; divided medianly.

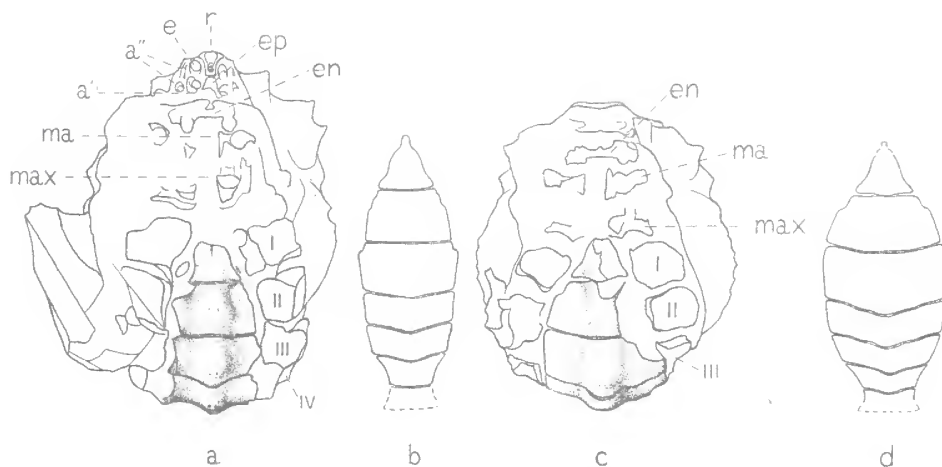


Figure 1. *Homolopsis etheridgei* (H. Woodward).

a. Male, ventral view of cephalothorax with attached abdomen, F. 2843 (Q.M.). b. Male, abdomen restored from several specimens. c. Female, ventral view of cephalothorax, with attached abdomen, F. 910 (G.S.Q.). d. Female, abdomen restored from several specimens. All natural size.

r., rostrum; ep., epistome; en., endostome; e., cyostalk; a', antennule; a'', antenna; ma., mandible; max., third maxilliped; I-IV, coxae of pereopods.

Branchio-cardiac furrows strong, curved, posteriorly converging behind cardiac region, then sharply diverging, continuing around ventro-lateral margin and delimiting a flange bordering sternal surface; branchio-cardiac furrows anteriorly joining cervical, ventrally separating hepatic and narrow pterygostomian regions and joining furrow separating hepatic and gastric regions. Cardiac region inflated, pentagonal, posteriorly acute, ornamented with some small irregularly dispersed granules. Antero-branchial lobes inflated, circumscribed by furrows; mesobranchial lobes with smaller inner and larger irregular outer prominence; epibranchial lobes with irregular tubercles. Postero-branchial lobes large, conspicuously ornamented dorsally with numerous irregularly dispersed rounded tubercles, becoming smooth ventro-laterally. Intestinal region low, smooth.

Abdomen of seven segments, attached dorsally, incompletely folded beneath cephalothorax; no trace of vestigial uropods. Leaf-shaped in male, greatest width at fifth segment, about one-third that of carapace; telson small, triangular, with longitudinal depression towards tip; median longitudinal ridge with elevations bearing two granules transversely and flanked by depressions on tergal surface of second to sixth segments. Female abdomen wider, width half that of carapace; sculpture less pronounced than in male.

Eyestalks stouter than antennae and antennules, not concealed by orbits; basal antennular joint enlarged. Epistome small, triangular, in contact with process from under rostrum; separated by strong ridge from endostome. Buccal frame quadrate; third maxillipeds sub-operculiform.

Chelipeds equal, granulated especially on outer surface, shorter than second and third pereopods; arm as long as hand, expanded at attachment of wrist; hand and wrist short, thick; palm longer than fingers. An oblique oval tubercle adjacent to inner side of each coxa. Chelipeds disproportionately larger in largest males. Third pereopod longer, stouter than second; merus in each sub-circular, compressed, with longitudinal groove on postero-lateral surface, crenulated and granulated dorsally and ventrally. Fourth reduced, sub-dorsal in attachment; merus grooved and crenulated as in third, but reduced by half. Fifth dorsal in attachment, further reduced, but length of curved, slightly crenulated merus little less than that of fourth; dactylus short, hooked.

Surface of carapace, abdomen and appendages punctate.

Homolopsis etheridgei is the most abundant of the Cretaceous crabs so far obtained in Queensland. It is closest to the type of the genus, *H. edwardsi* Bell (1863), from the Albian of England, from which it differs in the more strongly sculptured carapace, delineation of the cardiac region, more produced anterior, and the elliptical rather than quadrate transverse section. In *H. etheridgei* the ornament is independent of carapace size, whereas specimens of *H. edwardsi* show some variation in this respect (Carter, 1898).

Recent thelxiopids are in the main deep-water forms, often taken at depths between 100 and 1,000 fathoms (Alcock, 1901). The marine Cretaceous deposits of Central and Western Queensland were laid down in a shallow epicontinental sea. It would appear that the thelxiopids were among the crabs replaced in shallow waters by groups which developed during the Cretaceous.

Family PROSOPONIDAE von Meyer.

DIORATIOPUS gen. nov.

Carapace pentagonal, longer than wide, biconvex, anteriorly produced, sides subparallel; well differentiated; cervical and branchio-cardiac furrows equal; side-wall near vertical, with a prominent lateral line.

Rostrum short, triangular, anteriorly directed; orbits incomplete, orbital depressions wide, shallow. Fourth and fifth pereopods reduced.

GENOTYPE.—*Dioratiopus salebrosus* sp. nov.

DIORATIOPUS SALEBROSUS sp. nov.

Plate 2, figures 4-5 ; figure 2.

MATERIAL.—Type, F.14927, 10 miles N. of Dartmouth, Central Queensland (U.Q.). Female, carapace preserved as external and internal moulds, shell material largely lost, pereopods partially preserved.

F.14928, 10 miles N. of Dartmouth, Central Queensland (U.Q.).

AGE.—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—Type, 24.3 mm. ; young individual (without rostrum), 10.3 mm.

Carapace pentagonal, longer than broad (ratio 1.13 : 1), equally convex longitudinally and transversely ; anteriorly produced, sides straight, subparallel ; postero-laterally rounded ; posteriorly straight. Regions and lobes moderately well delimited, not strongly sculptured, ornamented with sharp granules ; furrows equal, distinct. Side-walls near vertical, gently reflexed, no lateral edge. Lateral line of least calcification crossing the side-wall and passing ventrally to sub-orbital surface.

Frontal region with blunt, broadly triangular rostrum, anteriorly directed, slightly excavated posteriorly, with two small elevations towards base. Orbits incomplete ; depressions for eyes wide, smooth, shallow, somewhat backwardly directed, extending to antero-lateral angle. Lower border entire, sharp ; upper border smooth, concave between blunt inner and sharp outer supra-orbital spines. Gastric region bordered posteriorly by broadly V-shaped cervical furrow ; cervical furrow vertical on side-wall posterior to hepatic region and united with branchio-cardiac furrows. Mesogastric lobe with narrow produced anterior portion, delimited by two furrows passing anteriorly into base of rostrum. Hepatic region small, separated from gastric by slight depression. Urogastric region lunate ; bordered posteriorly by furrow partially filled with granules medially, and fading laterally before reaching cervical furrow.

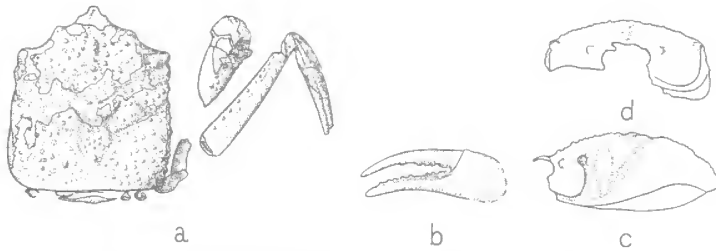


Figure 2. *Dioratiopus salebrosus* gen. et sp. nov. Type.

a. Dorsal view. b. Left side of hand and fingers of right cheliped. c. Left side of carapace showing line of least calcification. d. Anterior view of carapace. All natural size.

Branchio-cardiac furrows posteriorly weak, curved ; laterally stronger, straight ; anteriorly joining cervical and bordering hepatic region ventro-laterally. Cardiac region pentagonal, slightly elevated. Antero-branchial lobes subdivided by two transverse furrows. Postero-branchial lobes large, less granulated laterally ; each with a small elevation adjacent to cardiac region. Intestinal region not delineated.

Abdomen of female large ; sides subparallel ; greatest width at fifth segment, almost three-fifths that of carapace ; median longitudinal ridge with narrow transverse elevation on tergal surface of second to fifth segments.

Buccal frame quadrate.

Chelipeds not robust; shorter and stouter than second and third pereopods; arm rounded triangular in section, with sharp granules on edges, very spinous at attachment of wrist. Plane of hand slightly incurved; hand longer than arm; fingers dentate, distally slightly ventrally curved, longer than palm. Second and third pereopods equal; merus in each compressed, with longitudinal groove on postero-lateral surface, armed with spinous granules dorsally and ventrally. Carpus of second short, angular; propodus long, tapering, slightly curved, grooved. Oviduct opening on coxa of third pereopod. Fourth reduced, attached at extremity of straight posterior of carapace. Fifth further reduced, very slender, dorsal in attachment.

Carapace, abdomen and appendages non-punctate.

Dioratiopus is readily distinguished from other prosoponid genera by the combination of such characteristics as the pentagonal outline, the near vertical side-wall with the prominent lateral line, the anteriorly directed rostrum and the wide, shallow orbital depressions. The position of the line of least calcification suggests it is homologous with the linea dromiidaica of the Dromiidae. The carapace of the young individual has broken away along the line confirming that its function was connected with moulting. *Dioratiopus* appears to be the first prosoponid genus in which the lateral line and the position of the oviduct opening have been described.

TORYNOMMA gen. nov.

Carapace sub-quadrate, equidimensional, biconvex; well differentiated; furrows equal, cervical sinuous laterally; side-wall vertical, with lateral line at base.

Rostrum narrow, antero-ventrally directed; orbits incomplete, orbital depressions moderately deep, lower border sharp, produced. Anterior projection of epimeral attractor muscle furrows deep. Cardiac region short, with three posterior projections.

Chelipeds robust; fourth pereopods reduced; fifth extremely reduced, set close to mid-line of carapace.

GENOTYPE.—*Torynomma quadrata* sp. nov.

TORYNOMMA QUADRATA sp. nov.

Plate 2, figures 6-7; figure 3.

MATERIAL.—Type, F.2877, 10 miles N. of Dartmouth, Central Queensland (Q.M.). Nearly complete carapace, with broken pereopods.

F. 2878, F. 2879, F. 2880, F. 2881, 10 miles N. of Dartmouth, Central Queensland (Q.M.). F. 14924, F. 14926, 10 miles N. of Dartmouth, Central Queensland (U.Q.).

AGE.—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—Type, 20.6 mm.; other specimens, 17.5-22.0 mm.

Carapace sub-quadrate, equidimensional, convex longitudinally, less so transversely; anteriorly not produced, sinuous; sides slightly curved; postero-laterally rounded; posteriorly almost straight. Regions and lobes moderately well delimited, ornamented with tubercles and fine granules; furrows equal, distinct but not deeply impressed. Side-walls vertical, no lateral edge; lateral line of least calcification at base.

Frontal region with narrow medianly furrowed rostrum, almost ventrally directed. Orbits incomplete, depressions for eyes wide, smooth, moderately deep, laterally directed, extending to antero-lateral angle. Lower border sharp, produced as tooth-like process extending beyond upper border; latter smooth, concave between blunt inner and sharp outer supra-orbital spines, projecting anteriorly almost to level of rostrum. Gastric region bordered posteriorly by cervical furrow with arms sinuously curved, uniting with branchio-cardiac furrows low on side-wall. Mesogastric lobe slightly elevated posteriorly, divided by median depression; narrowly produced anteriorly, delimited by two furrows confluent with continuation of rostral furrow which separates slightly elevated epigastric lobes. Protogastric lobes large, each with small tubercle. Hepatic region small, ornamented with three granules posterior to outer supra-orbital spine; not distinctly separated from protogastric lobes. Urogastric region separated from cardiac region by furrow; incompletely delimited from antero-branchial lobes.

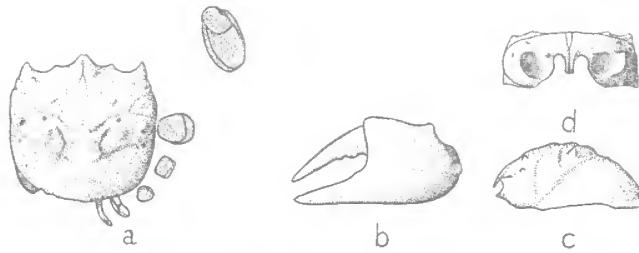


Figure 3. *Torinomma quadrata* gen. et sp. nov.

a. Dorsal view of type; last two pereopods have been pushed upwards and the true posterior of carapace is obscured by matrix. b. Left side of hand and fingers of left cheliped based on F. 14924 (U.Q.). c. Left side of carapace of type, apparently broken along line of least calcification. d. Anterior view of carapace, F. 2880 (Q.M.). All natural size.

Branchio-cardiac furrows laterally distinct, straight; posteriorly weak. Cardiac region broad, with three posterior projections (seen especially in decorticated specimens). Two deeply incised furrows lateral to cardiac and urogastric regions marking attachment of anterior part of epimeral attractor muscle. Antero-branchial lobes subdivided by oblique furrow; epibranchial lobes small, not sculptured; mesobranchial lobes with two large granulated tubercles. Postero-branchial lobes slightly inflated; more coarsely granulated than remainder of carapace; separated by depressed area from broad intestinal region, posteriorly bordered by smooth rim.

Abdomen in male small, sides subparallel, with greatest width about three-eighths that of carapace; constricted to about one-quarter width of carapace at attachment.

Thoracic sternites in male deeply excavated for reception of abdomen; sutures oblique.

Chelipeds equal, relatively large, strong; arm shorter than carapace, expanded distally, triangular in section, granulated on edges; wrist inflated with three dorsal rows of tubercles and five granulations between rows; hand slightly longer than carapace, smooth, with large dorsal tubercle near carpal articulation; movable finger with blunt proximal tooth, shorter than palm. Second and third pereopods slightly longer than chelipeds; merus in each laterally compressed, finely granulated on edges; carpus short, angular, with dorsal keel; propodus angular, longer, tapering. Oviduct opening on postero-internal angle of coxa of third pereopod. Fourth pereopods reduced. Fifth pereopods very slender, attached close to mid-line of carapace.

Surface of carapace, abdomen and appendages non-punctate.

An analysis of the morphology indicates that while these new prosoponid genera *Torynomma* and *Dioratiopus* differ greatly in appearance, structurally they have much in common. *Torynomma* bears some superficial resemblance to *Mithracites* Gould from the Lower Aptian of England, but exhibits important differences in the structure of the rostrum, the side-wall, and in the reduction of the last two pairs of legs.

The relatively deep impression of the furrows in *T. quadrata*, marking the position of attachment of the anteriorly projecting part of the epimeral attractor muscle, may be correlated with the reduction of the abdomen. Glaessner (1933) recognised the significance of these longitudinal depressions. A similar condition exists in the fossil dromiacean, *Dakoticancer overana* Rathbun (1917), from the Upper Cretaceous of South Dakota, U.S.A.

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EXPLANATION OF PLATE 2.

Homolopsis etheridgei (H. Woodward).

- Fig. 1. Dorsal view of carapace ; type, F. 2875 (Q.M.).
Fig. 2. Right side of undistorted carapace ; F. 2796 (Q.M.).
Fig. 3. Anterior view of carapace showing rostrum, incomplete orbits, and broken segments of eyestalk, antenna and antennule ; F. 2847 (Q.M.).

Dioratiopus salebrosus gen. et sp. nov.

- Fig. 4. Dorsal view of carapace with broken pereopods ; type, F. 14927 (U.Q.).
Fig. 5. Dorsal view of carapace of young individual ; F. 14928 (U.Q.).

Torynomma quadrata gen. et sp. nov.

- Fig. 6. Dorsal view of carapace with broken pereopods ; type, F. 2877 (Q.M.).
Fig. 7. Dorsal view of carapace with chelipeds ; F. 14924 (U.Q.).

All natural size ; specimens from Tambo Formation, Upper Albian.
